



BERTBrain Gateway

SECURE & FLEXIBLE CONTROL

The BERTBrain Gateway is the central hub for managing BERT plug load and hardwired device controls. It supports both cloud-connected and on-premises deployments, providing robust, secure, and scalable infrastructure for your energy management needs.



DEPLOYMENT OPTIONS

Cloud-Connected (Recommended)

Benefits

- Automatic software updates and feature enhancements
- Seamless scalability and centralized management
- Extensive, real-time alerts and notifications
- Remote diagnostics and support
- Access to advanced integrations, including AI/ML analytics (coming soon)
- Automated, off-site backup of schedule and energy usage data
- Offline functionality—operates without cloud connection, ensuring reliability

On-Premises

Benefits

- Local-only data storage and processing
- No external connectivity requirements



HARDWARE & NETWORK REQUIREMENTS

Static IP Address

- All BERT devices communicate exclusively with the BERTBrain Gateway’s IP

Network Connection

- Wired LAN strongly preferred for reliability and performance
- Wi-Fi supported (WPA/ WPA2-Enterprise or PSK, MAC authentication optional)

Storage

- Minimum 128GB onboard (multi-year data retention)
- Expandable via NAS or external USB drive

Deployment Comparison

FEATURE	CLOUD	ON-PREMISES
Automatic Updates	Yes	Manual/Local
Automatic Backup	Yes	Manual/Local
Remote Support	Yes	Optional (VPN required)
Remote Management	Yes	Optional (VPN required)
External Integrations	Yes	No
Data Residency	AWS (encrypted)	Local Storage
Real-time Alerts	Yes	Limited
SSO/OAuth	Yes	Yes
Network Isolation	VLAN/Wi-Fi supported	VLAN/Wi-Fi supported
Security	TLS, VPN, Signed Updates	TLS, Signed Updates

SECURITY ARCHITECTURE

Gateway Security

No Public Inbound Access

- All connections are outbound initiated only

Outbound Communication

- HTTPS over TLS 1.2/1.3 (AES-256-GCM encryption, SHA-256 integrity)

Device Authentication

- Device-specific API keys (securely provisioned and stored)
- Mutual authentication for MQTT (port 8883, TLS)

Operating System Hardening

- Read-only root filesystem
- Signed OTA updates (RSA-2048 signatures)
- Protection against unauthorized modifications

Cloud & Data Security

Cloud Infrastructure

- Hosted on AWS, leveraging AWS best practices

Private Connectivity

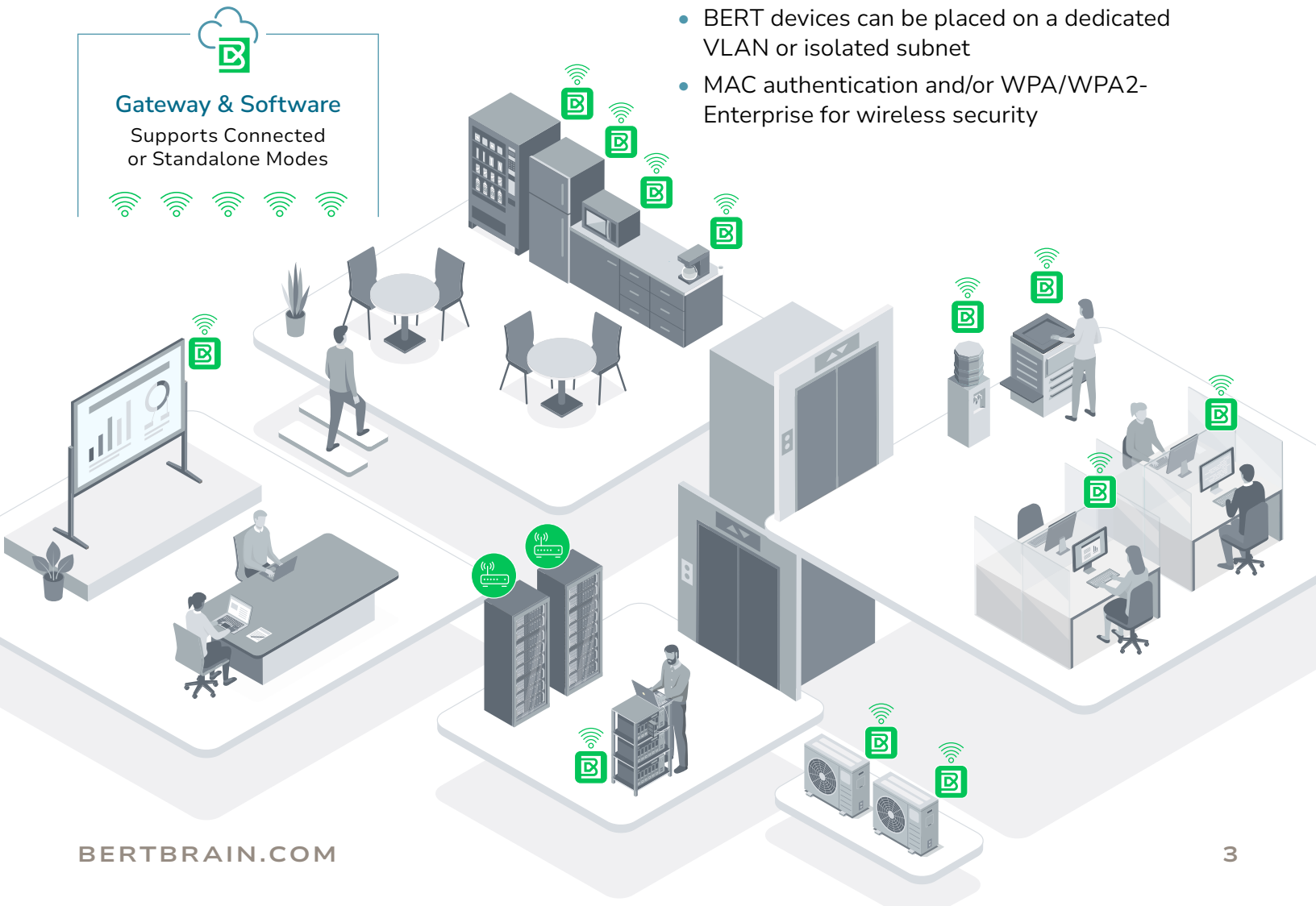
- AWS Site-to-Site VPN (IPsec with AES-256, SHA-256)

Data Encryption

- All data encrypted in transit and at rest
- HTTPS with AWS-managed certificates (ECDSA P-256 or RSA-2048)
- MQTT over TLS with X.509 certificates
- AWS Signature Version 4 (HMAC-SHA256) for API integrity
- Network Segmentation & Device Isolation

Device Network Isolation

- BERT devices can be placed on a dedicated VLAN or isolated subnet
- MAC authentication and/or WPA/WPA2-Enterprise for wireless security



IDENTITY & ACCESS MANAGEMENT

Single Sign-On (SSO)

- Agnostic to provider – supports third-party OAuth integrations

Role-Based Access

- Granular permissions for local and remote management

MAINTENANCE & SUPPORT

Automatic Updates

- Cloud-connected gateways receive security patches and new features automatically

Remote Support

- Secure remote diagnostics and troubleshooting (cloud)

Local Management

- Basic functionality available offline for on-premises deployments

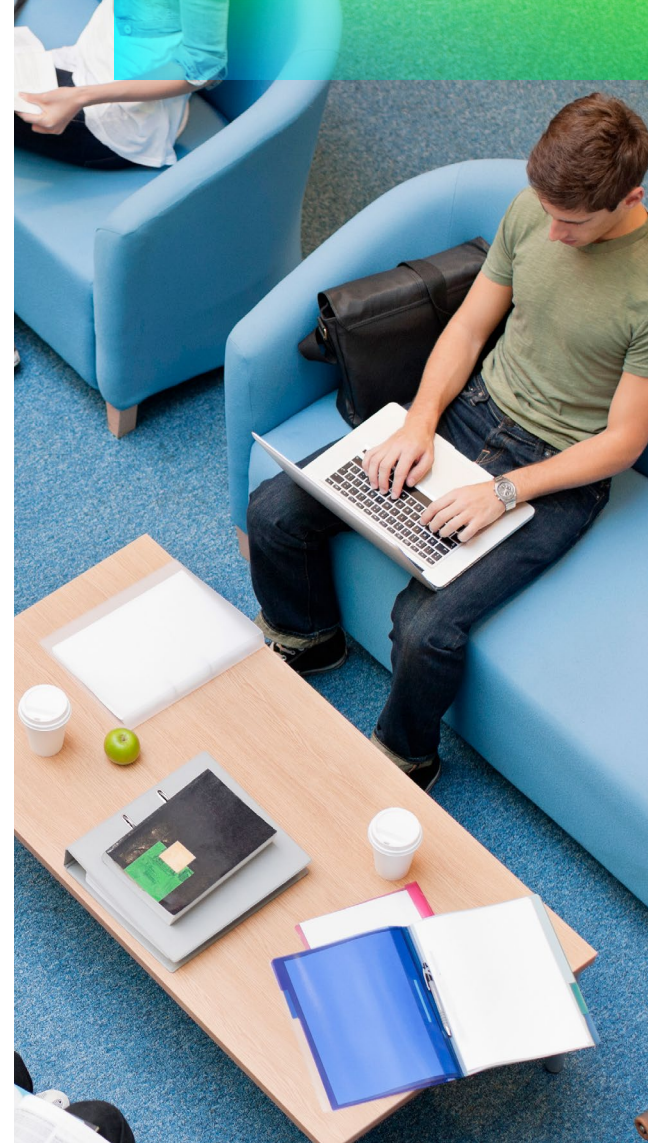
ADDITIONAL RECOMMENDATIONS

IT Security

- Place the Gateway and BERT Controls on a dedicated management VLAN (IoT)
- Restrict outbound traffic to only required endpoints and ports
- Regularly review device authentication credentials and update as needed

Scalability

- Consider cloud mode for multi-site or enterprise-wide deployments
- Use on-premises mode for air-gapped environments



DID YOU KNOW?

40%

of plug load energy consumption can be reduced through effective management strategies.